Quarterly Progress Report

March to May, 1974

HYDROLOGIC SIGNIFICANCE OF LINEAMENTS IN CENTRAL TENNESSEE (FORMERLY HYDROLOGIC SIGNIFICANCE OF FAULTS IN THE GREAT SMOKY MOUNTAINS NATIONAL PARK)

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TITLE: Hydrologic Significance of Lineaments in Central Tennessee (Formerly Hydrologic Significance of Faults in the Great Smoky Mountains National Park).

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OBJECTIVE OF STUDY: To determine the feasibility of mapping lineaments on S-190 photography of central Tennessee and to determine the hydrologic significance of these lineaments, particularly as concerns the occurrence and productivity of ground water.

PROGRESS AND OVERALL STATUS: The test site has been moved to central Tennessee because the original site was obscurred by clouds and haze. Location and coordinates of the new test site are shown by the attached map. (fig. 1).

SKYLAB 2 photos of the new test site have been given a preliminary examination by the investigators. Several lineaments can be seen on single photos and others are visible when the photos are viewed in stereo. Most lineaments are more obvious when the photos are viewed at a magnification of 5X to 12X.

Other preliminary observations are that (1) all visible lineaments have a topographic expression and are enhanced by land-use patterns, (2) small fracture traces are not visible on S-190 photos, and (3) the locations of at least two large springs are obvious because of vegetation patterns on the S-190 photos.

The first-look phase of this study is nearly complete, and the investigators are satisfied with the quality of SKYLAB data for the new test site. There is good reason to believe that the objectives of the study can be accomplished in the central Tennessee area.

Progress is about 2 months behind the schedule that was specified in the milestone plan. This delay has resulted mostly from the need to move the test site and the selection of the new site. The investigators plan to make-up this time in the next quarter and plan to complete the final report by June 1975.

REQUIRED DECISIONS AND ACTIONS: The selection of a new test site has changed the data requirements for this study. Multispectral, B&W, S-190A photos of the new test site are requested. In addition, aerial photos will reduce the need for ground truth. High altitude, color IR photos of the test site, obtained by Rome Air Force Base in May 1973, have been

requested from Marshall Space Flight Center.

EXPECTED ACCOMPLISHMENTS IN NEXT QUARTER: The first-look phase of study will be completed in the next quarter and the post-launch phase will begin. Specifically, the investigators plan to complete items 1 through 4 in the milestone plan for the post-launch phase and to begin items 5 and 6. Locations for test drilling will be selected in the next quarter.

SIGNIFICANT RESULTS: None.

SUMMARY OUTLOOK: The investigators plan to complete a successful study of the new test site by June 30, 1975. Significant results should begin to appear in the next quarter of study.

TRAVEL PLANS: One or more trips to the test site probably will be necessary in the next quarter.

MISCELLANEOUS: None.

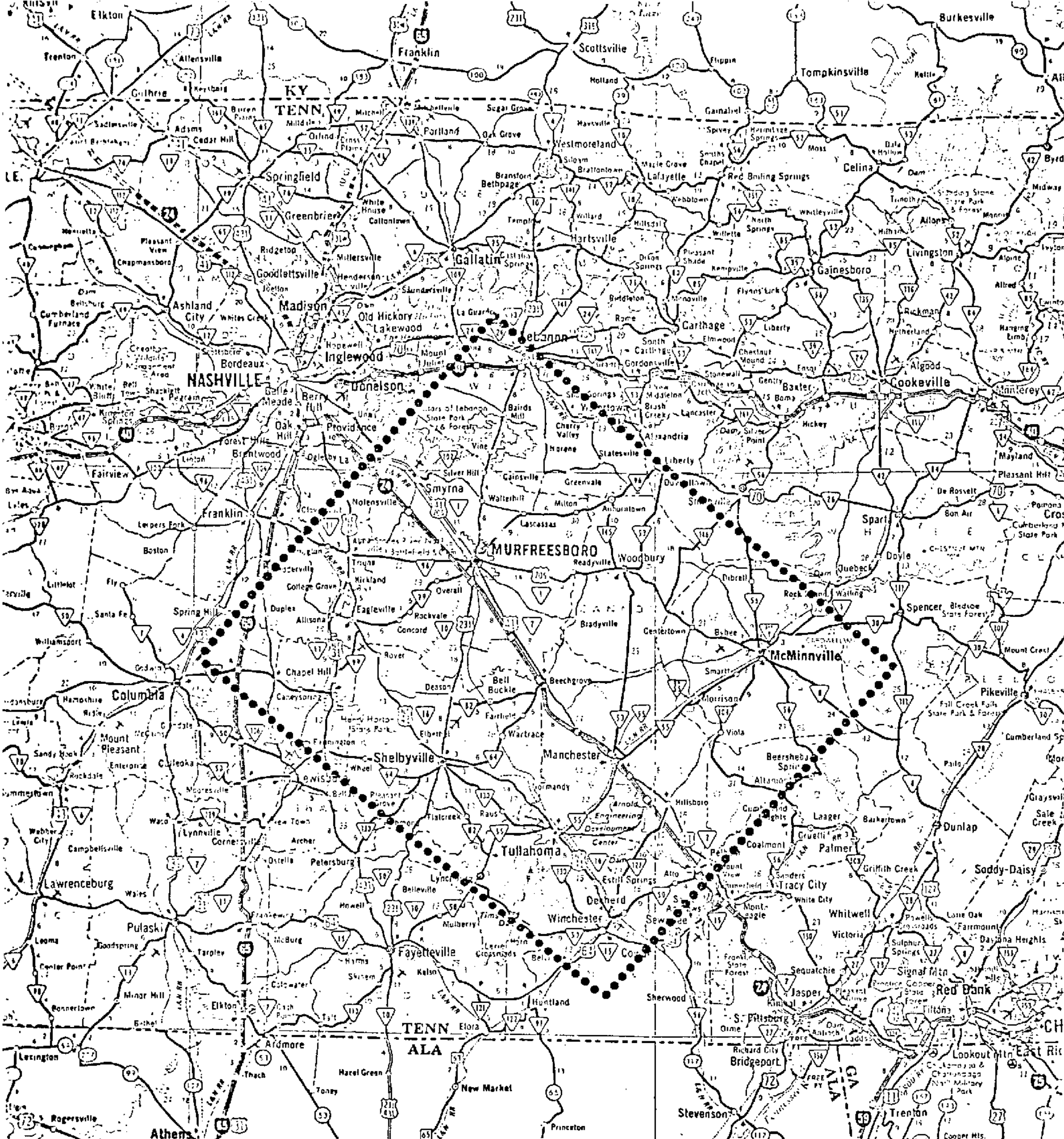

Figure 1.--The Murfreesboro, Tennessee test site. Corner coordinates 36° 17'N 86° 20'W, 35° 40'N 86° 59'W, 35° 04'N 86° 06W, 35° 40'N 85° 30'W.